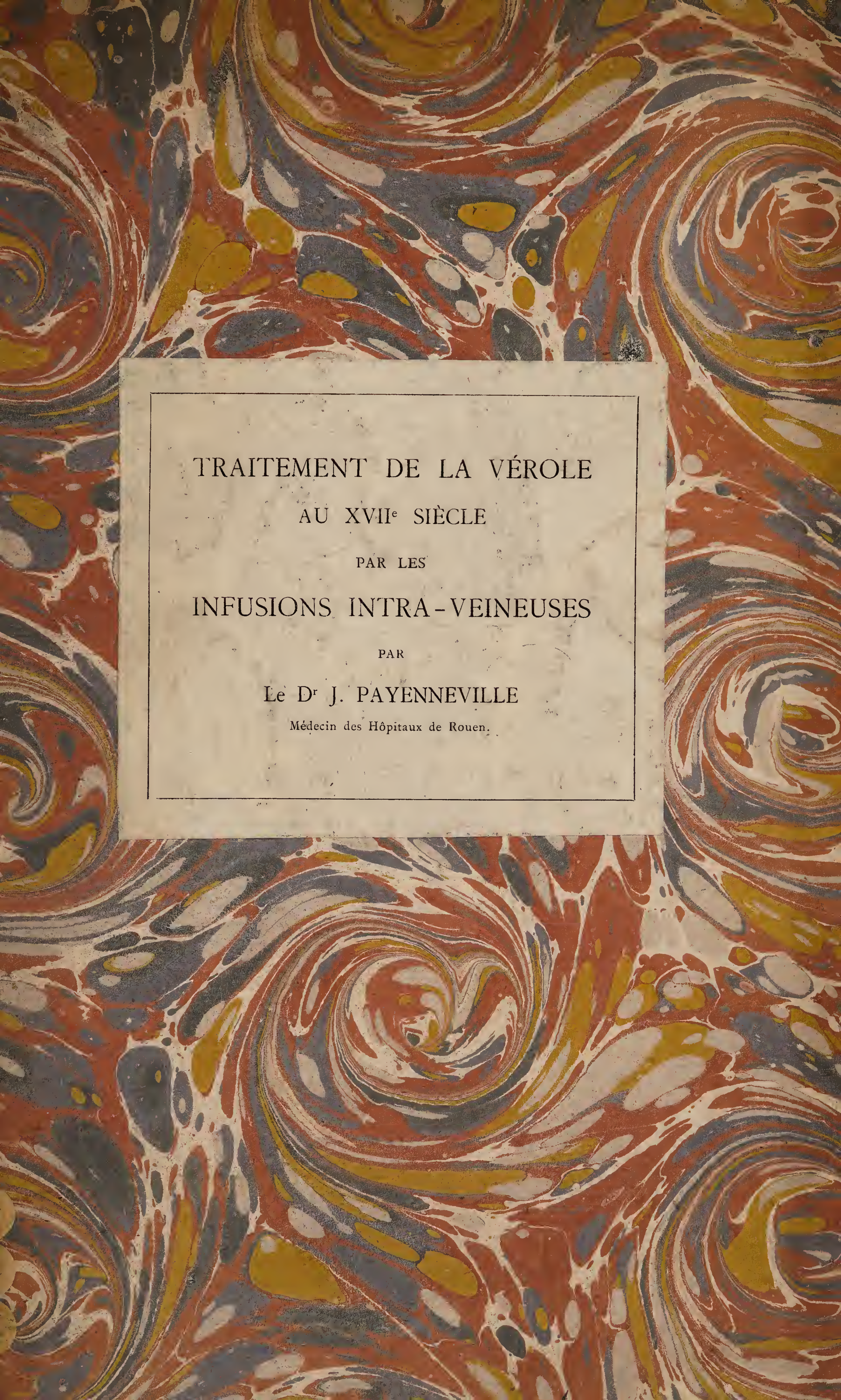


TRAITEMENT DE LA VÉROLE
AU XVIIe SIÈCLE
PAR LES
INFUSIONS INTRA-VEINEUSES
PAR

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Hommage de l'auteur

G. Hayem

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ROUEN

IMPRIMERIE LECERF FILS

1911



Cliché MAURIZE.

(Curieux frontispice de l'ouvrage d'Ettmuller représentant, d'une façon un peu allégorique, l'opération de l'infusion intra-veineuse.)



TRAITEMENT DE LA VÉROLE
AU XVII[e] SIÈCLE
PAR LES
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« Nil novi sub sole » *in Ecclesiaste.*

En dehors de l'intérêt qu'elle présente pour les bibliophiles dont elle satisfait la curiosité, la lecture des vieux ouvrages de médecine est parfois aussi bien instructive. Elle nous apprend à être un peu plus modeste et à ne pas nous attribuer des prétendues découvertes que d'autres avaient faites deux ou trois cents ans avant nous. Le vieux proverbe est donc toujours vrai, qu'on en juge par le fait suivant. Il y a quelques années un auteur italien[1] instituait une méthode de traitement par les injections intra-veineuses spécialement pour la syphilis. Depuis, un certain nombre de syphiligraphes ont continué à considérer cette méthode

1. Bacelli, 1893, *in Gaz med. di Roma*, XIX, 241-245.

comme nouvelle, chacun même cherchait à y attacher son nom en ajoutant quelque détail à la technique. Or, dans la seconde moitié du XVIIe siècle un auteur très érudit, Michel Ettmuller, de Leipzig, écrivait un traité sur « Les infusions intra-veineuses des médicaments »[1].

Cet ouvrage, qui en beaucoup d'endroits pourrait être considéré comme écrit de nos jours, mériterait certes une analyse minutieuse, mais je n'ai eu en vue dans cette note que le traitement de la vérole par cette méthode, et je ne citerai que les passages qui s'y rapportent; ils ne manquent pas d'ailleurs d'originalité. On me permettra pourtant de montrer par quelques détails combien déjà à cette époque la question avait été étudiée à fond. C'est d'abord l'idée directrice qui détermina la découverte de cette méthode. « Plus les maladies, ces ennemis jurés de » nôtre vie, nous poursuivent à outrance, plus la » Médecine empressée à nous deffendre s'aplique à » forger des armes pour soûtenir et repousser généreusement leurs efforts; et c'est à cette aplication » que nous devons tant de belles découvertes ausquelles l'antiquité n'a pas même songé... L'opé-

1. Ce fut un médecin anglais, Christophe Wren, qui le premier fit des infusions intra-veineuses de liqueurs à des animaux. Après lui, Robert Bayle, Timothée Clarke, Richard Lower reprirent les mêmes expériences et les appliquèrent même à l'homme. Enfin, Jean Sigismund Esholz (1661), et surtout Jean Daniel Mayor (1664), de Kiel, firent des essais sur l'homme avec des médicaments, se disant, chacun de leur côté, l'inventeur de cette nouvelle méthode de traitement.

» ration Chirurgique de l'infusion est une des plus
» importantes de nos nouveautés ; n'est-ce pas un
» art bien excellent d'ouvrir une veine avec un
» instrument aproprié, pour y introduire un remède,
» qui remplisse avec une promptitude admirable
» et sans perdre rien de sa vertu les veuës ausquelles
» le Médecin le destine[1] ». Ne croirait-on pas lire la préface d'un ouvrage moderne exposant les derniers traitements qui doivent juguler et stériliser la vérole en particulier. D'ailleurs, bien qu'il soit permis de penser que ce ne fut pas à cette époque le traitement de la syphilis qu'avait spécialement en vue l'inventeur des infusions intra-veineuses, il faut cependant noter que dans l'énumération des essais qui furent tentés figure le récit d'une cure merveilleuse d'un pauvre soldat vérolé : « On fit l'in-
» jection, dit l'auteur, de sept dragmes de résine de
» scammonée, infuses dans l'essence de guaïac, dans
» l'hopital de Dantzic à un soldat qui avait la vérole
» invétérée avec des ulcères aux jambes, une tumeur
» au bras droit, des douleurs de tête insupportables,
» des exostoses et des nodus aux os, il vomit et en
» vingt-quatre heures les symptômes[2] s'apaisèrent,
» les ulcères furent consolidés en trois jours ». Le médecin de Dantzig qui tenta cette expérience était un nommé Schmidt, et il faut croire que cet événement fit un certain bruit, car il fut relaté par le

1. *Dissert. sur l'infusion des liqueurs,* Michel Ettmuller, 1691, chapitre premier.

2. *Id.*, p. 352.

Journal des savans. Déjà à cette époque les traitements nouveaux de la syphilis avaient les honneurs de la presse [1].

Cette soi-disant expérience avait d'ailleurs été précédée d'une série de recherches de laboratoire faites sur des animaux; le récit très détaillé en est fait par Ettmuller, et en somme nos ancêtres ne faisaient pas à cette époque moins bien que ce que nous faisons maintenant. Je détache de cette partie un essai qui fut tenté avec le mercure par Esholz : « Je dissous, dit-il, demi dragme de mercure sublimé, » dans de l'eau simple et sans attendre que tout le » mercure fut dissous, j'injecte un peu plus d'une » dragme de cette dissolution dans la veine d'un » gros mâtin....., il mourut lorsque nous n'y » pensions pas, en faisant un grand cri et une » grande secousse. Dans la dissection nous fumes » surpris de trouver le sang dans le cœur, dans le » tronc de la veine cave, même proche de l'incision, » aussi fluide et tenu que le sang d'un chien étran- » glé et sans aucune apparence de coagulation » [2].

Cet insuccès fut peut-être la raison pour laquelle on n'employa pas le mercure dans le traitement de la vérole par les infusions intra-veineuses; cependant je pense aussi que la crainte qu'inspirait le fameux vif-argent fut pour beaucoup dans l'abandon de ce remède à une époque où devaient bientôt éclore

1. *Journal des savans*, 1668, p. 436.

2. Ettmuller, *Diss. infusions*, p. 350.

toutes les drogues spéciales antivénériennes des empiriques.

Après avoir énuméré tous les cas dans lesquels les infusions sont indiquées, l'auteur arrive à la vérole ; il la range avec plusieurs autres maladies dans ce qu'il appelle « les cachexies ». Il n'avait peut-être pas tout à fait tort, car nous savons maintenant combien la syphilis est anémiante, et dans quel état de déchéance physique elle peut plonger ceux qu'elle atteint. « La méthode ordinaire de la guérir, dit-il, » tantôt par les décoctions sudorifiques des bois, » tantôt par les frictions de mercure qui excitent » la salivation, et quelquefois par les parfums avec » le cinnabre, est connuë aux plus petits apprentis » de la Chirurgie, et souvent elle réussit quand le » mal n'est pas trop invétéré car après la salivation » qui atténuë extrêmement les malades, on les voit » redevenir gras en peu de jours, mais si le mal est » invétéré, si les malades ne peuvent souffrir le » mercure, ne peut-on pas imiter le médecin de » Dantzic qui aporta par une injection un soulagement soudain à son malade. J'ai de la peine à » croire que la cure fut parfaite, quoy que je ne » doute pas de sa possibilité, surtout si on fait » précéder les remèdes universels...[1].

Ce septicisme relatif de l'auteur, qui en somme s'était fait le vulgarisateur de la méthode, est assez curieux à noter. On ne peut d'ailleurs s'empêcher de sourire quand on arrive à l'énumération de toutes

1. Ettmuller, *Infusions*, pp. 446-447.

les drogues les plus invraisemblables qui sont proposées comme des soi disant spécifiques de la vérole. En tête vient d'abord le fameux guaïac ou « bois saint », le sassafras associé à l'esprit de fumeterre, puis la bardane, la benoite, les sarments de houblon et de chevrefeuille, etc., etc., et pour finir l'esprit volatil de corne de cerf, de serpent et de vipère. « Si on injectait, ajoute l'auteur, l'essence ou le sel » volatil de vipère dissous dans une liqueur conve- » nable, j'en attendrais un heureux succès »[1].

Cela ne doit pas nous étonner, car la vipère jouissait d'une très grande vogue, comme en fait foi certaine lettre de Mme de Sévigné à sa fille[2].

Bien que je ne me sois engagé en commençant à ne citer que ce qui avait trait spécialement à la syphilis, je ne puis m'empêcher de relever quelques détails de technique qui montrent que les chirurgiens de ce temps-là savaient déjà opérer avec beaucoup de précision.

« Cette opération ne demande pas un grand » appareil ny une grande adresse, on commence » d'abord par l'élection du vaisseau dans lequel on » veut faire l'infusion..., le vaisseau déterminé on » frotte la partie avec des linges chauds ou bien on » la bassine avec du vin chaud, de l'eau de sureau » chaude, ou de l'esprit de vin camphré ». Rien ne manque, on peut le voir, même pas l'antiseptie et

1. Ettmuller, *Diss.*, *infus.*, p, 448.

2. *Lettres de Mme de Sévigné*, tome VI, p. 58.

le nettoyage de la peau. Vient ensuite la description détaillée de la ponction de la veine avec toutes les précautions à prendre, enfin l'introduction de la canule qui remplaçait l'aiguille que nous employons maintenant, avec l'énumération des instruments nécessaires : « outre la lancette ordinaire on a besoin » que d'un seul instrument pour contenir la liqueur » à infuser, qui est une canule ou un siphon d'ar- » gent étroit au bout et un peu recourbé pour » emboîter dans la veine; à l'autre bout il y a une » petite vessie attachée remplie du médicament » qu'on veut injecter ; en pressant la vessie la li- » queur suit le tuyau emboîté dans la veine. Une » petite seringue d'argent d'une grandeur médiocre » pour couler la liqueur dans la veine est bien » plus aisée et plus expéditive et par conséquent » meilleure que l'instrument à vessie [1] ».

D'autres auteurs se sont peut-être occupés de perfectionner cette manière de faire déjà bien réglée, mais rien ne permet de l'affirmer. Cela nous semblerait assez logique à notre époque, où chacun a non seulement une méthode mais un appareil à lui, ce dernier naturellement meilleur que les autres. Certains syphiligraphes modernes poussent même plus loin la recherche de l'originalité et emploient en les rajeunissant des expressions abandonnées depuis longtemps. C'est précisément le cas du mot infusion, que l'on a pu voir remplacer celui d'injection, dans un travail récent sur le 606. Mais je

1. Ettmuller, *Diss. inf.*, pp. 355-356.

m'arrête, car ces considérations m'entraîneraient en dehors du sujet que j'aurai d'ailleurs traité complètement quand j'aurai montré tout le bon sens clinique que renfermaient les conclusions de l'auteur. Il ne conseillait pas en effet cette méthode dans tous les cas, mais en faisait au contraire une méthode d'exception. « Je suis d'avis, disait-il, qu'on mette » d'abord en usage les remèdes que les loix de l'art » fondées sur la raison et sur l'expérience ont au- » thorisez, et qui sont conformes à la véritable » méthode, plutôt que de venir à l'infusion dès la » première attaque... L'infusion ne doit pas mar- » cher à la tête de l'armée, mais avec le corps de » réserve [1] ».

Cette métaphore originale résumait bien pour Ettmuller le chapitre des indications de cette thérapeutique nouvelle. Ne pourrait-on pas en dire autant de nos jours ? Et en somme l'histoire de « l'infusion intra-veineuse » n'est-elle pas celle de beaucoup de prétendues découvertes modernes ?

1. Ettmuller, *Diss. inf.*, p. 359.



IMP. LECERF, ROUEN.



EXTRAIT
de
„J A N U S”.
Huitième Année, VIIIe et
IXe Livr.
15 Août et 15 Septembre 1903.

ARNOLD DE VILLA NOVA ON THE THERAPEUTIC USE OF HUMAN BLOOD.

By JOSEPH FRANK PAYNE, M.D., *Londres*.

Having lately come across a curious document on this subject I think that although it is not actually unpublished, it may be of some interest to reprint it, in consideration of its bearing on the obscure question of the medicinal use of human blood. I first read the document in a Latin M.S. of the (early part of the?) fifteenth century in my possession, the greater part of which refers to other things 1), and not finding it in the collected works of Arnold de Villa Nova, I thought it had not been published. But I find it has been printed in the work called *Euonymus sive de Remediis secretis, (Pars Secunda)* attributed to Conrad Gesner (Ed. Lugduni 1572, page 289), also in an English version of this work, "*The newe Jewell of Health gathered out of the best and most* "*approved authors by Doctor Gesnerus; published in Englishe by George* "*Baker*" (London 1576), and also in Joannes de Rupescissa, "De Consideratione Quintæ Essentiæ" (Basil 1597). The printed texts agree pretty closely with my M.S.

The title of this curious production is Epistola domini (magistri) Arnoldi de Villa Nova ad dominum (magistrum) Jacobum de Tolleto. De præstantia et virtutibus aquæ humani sanguinis (vel de sanguine humano).

I need not discuss the conflicting accounts of the life of this mysterious personage. According to the most probable tradition he was born in Catalonia about 1235 and died 1312. He is said to have studied in Spain and at Paris, to have taught medicine at Montpellier and afterwards at Paris. It is certain that he was in Rome at the court of the Pope Bonifacius VIII in 1295. The alchymistic writings attributed to him were according to Haeser, probably written by another Arnoldus de Villa Nova, living at Montpellier in the 15th century. This introduces a further complexity into the question of the authorship of this letter.

Neither the M.S. nor the printed text can be regarded as certainly establishing the authenticity of the letter as actually written by Arnold. Its style certainly differs from that of his recognized works, but it is professedly addressed only to *secreti* et *ellecti*, that is, to a limited circle

1) The most important part of this M.S. is a treatise on the plague. "Tractatus de pestilentia Theobaldi Loneti de Aurigneo, bisuntinensis diocesis provinciæ Burgundiæ", which seems never to have been printed. I can find nothing about the author, and should be glad of any information.

of adepts; and this fact may, if it be genuine, explain its peculiarities. There are indications that Arnold wrote some works which were kept secret and not published to the world at large. It is stated (Haeser, Gesch. der Medicin, Vol. II, p. 721) that one of his manuscripts was missing after his death, and that Pope Clement V threatened with excommunication any one who should conceal it. Apparently therefore there were some treatises which the select circle of adepts endeavoured to keep secret, and this letter may have been one of them. It is evident that the letter if genuine, was written near the end of Arnold's life. I can find out nothing about Jacob de Toledo, to whom it is professedly addressed; but he may have been one of Arnold's old Spanish friends. The details of the letter seem to make it unlikely that it was a pure forgery. But whether rightly ascribed to Arnold or not, it was evidently a document circulated among the alchemists.

Leaving the question of authenticity to the judgment of the reader, I will therefore give the text. 1)

Epistola domini Arnaldi de Villa Nova ad dominum Jacobum de Tolleto.
De prestantia et virtutibus aquae humani sanguinis.

Magister Jacobe amice carissime, dudum me rogasti ut tibi secretum meum de sanguine humano, quod divina favente potestate, si per mei industriam quamvis non totaliter per multiplices experientias cum multiplicibus laboribus adinveni aliqua de quibus expertus essem transscribendo, significarem. Et quamvis diu distulerim, tamen jam senio appropinquante, omni livore semoto, ea quae de hoc secreto sum expertus, plenius enodabo. — Audi ergo, et audiant secreti et ellecti verba oris mei, quia spiritus sanctus ubi vult spirat et ideo in puteo poenitentia recludatur, qui fatuo alicui vel impotenti revelabit, quod antiqui requisiverunt nec invenire potuerunt, et scrutati sunt, et illud non habuerunt. Est et enim donum celeste, nobis indignis a deo destinatum, quod nec medici cognoverunt, nec philosophi, qui in alkimia laboraverunt, perceperunt. Sed testor deum, quod per varios labores, quos longo tempore in arte alkimia sustuli, prout scitis per experientiam cognovi, istius rei efficaciam tantam esse quod non sufficio tantae vigoris virtutem plenius explanare.

Et ideo in puteo paenitentiae recorderis Accipias ergo hoc secretum sc. sanguinem humanum, et sit sanguis virorum sanorum, et 2) aetatis infra 36

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1) There is one historical allusion which should be noticed, viz. that to a certain Comes Parisiensis. It is well known that Arnold was twice at Paris, and so this is some evidence of authenticity. Who this count was is doubtful. It could hardly mean the Comte de Paris, since that title was according to French historians merged by Hugues Capet in the title of King of France, and not again used till it was revived by Louis Philippe in favour of his grandson the Comte de Paris of our times. But I find there was another, not royal, title of Comte de Paris, or Parisse, borne by a noble family. It may however merely mean a Count living at Paris. He is called in the edition of 1597 Comes Faustinus.

2) Ætatis annorum viginti ad triginta. Ed. 1597. Ætatis infra 30 annos. Gesner 1572.

annos, et extrahito quatuor elementa, prout bene nosti in alkimia, et obtures bene quodlibet elementum per se, ne aer subintret.

Aqua enim valet in omnibus egritudinibus, tam calidis quam frigidis. Eo quod occultae est naturae, et complexionem lapsam reducit ad temperamentum.

Et maxime valet in patientibus vitium in spiritualibus et venenum repellit a corde. Arterias etiam ipsas habet dillatare et humectare.

Et dico pro constanti quod flegma grossum in pulmone retentum sine molestia dissolvit, et ipsum ulceratum, non obstante commotione, consolidat. Et breviter omnia corrupta in pulmone et membris spiritualibus purgat, et ea purgata preservat a corruptione.

Sanguinem etiam ultra omnem medicinam naturalem mondificat. Item fluxum ventris, a tota specie, curat. Apostema etiam a lateris mire sanat.

Aer etiam multum valet ad predicta, et forte plus quam aqua ipsa. Et maxime valet in juvenibus, ut in eodem statu fortitudinis et pulchritudinis permaneant, si utantur eo paulatim et in modica quantitate; et est quasi tantae virtutis quod nullo modo permittit sanguinem putrefieri, nec flegma super dominare nec coleram aduri. Praeterea ultra modum multiplicat sanguinem et sperma. Et ideo oportet quod utentes eo saepe flebotomentur.

Insuper illud elementum aperit nervos et venas, et si aliquid fuerit in ipsis diminutum, reducit ipsum ad debitum temperamentum;

Insuper probavi quod si juvenis aliquis ante statum suae aetatis seu in augmento qui habuerit oculum crepatum, quod si quolibet die de hoc elemento una gutta intra ponatur et si se tenuerit in quiete per mensem, sine dubio reddetur sibi visus;

Item si in aliquo membro aliquod superfluum, putrefactioni aptum inveniatur vel quod existit putridum, statim dissolvit et tollit, et si inveniatur diminutum addit restaurando;

Et valet hoc elementum in apoplexia, epylepsia, scotomia, vertigine, dolore emigranea et in omnibus istis debet administrari cum aliquo electuario ad propositum valente.

Ignis vero preciosior et admirabilior est, et ad omnia valet, ad quae valet aer. Et quod plus est, de mortuo homine facit vivum. Hoc ita intelligendum est, quod in hora singultus mortis detur de hoc igne, ad quantitatem grani tritici, distemperato cum vino, ita tamen quod guttur transeat, revificat ipsum hominem, et ingreditur ipsum cor subito expellendo superfluos humores, et cum hoc vivificat calorem naturalem ipsius epatis, ita quod quasi per unam horam ipse infirmus poterit loqui et disponere de testamento, et confessione. Et per hunc modum feci et vidi facere miraculum apud D. comitem pharisiensem 1) qui quasi mortuus jacuit, et statim postquam hoc medicamen sumpsit, confitebatur delictum suum cum multa contritione, et post horam expiravit. Et istud apud quamplures alios sum expertus;

Item si senex utatur hoc igne, omni die in modica quantitate, sublevat senectutem, exhilarando corda ipsorum, ita quod juvenilia possidebit corda. Et ideo

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1) Dominum Comitem Faustinum. Ed. 1597. Dominum Parisiensem. Gesner 1572.

vocatur hic ignis Elixir vita, nec tamen est Elixir alkimia, quia hoc est de sanguine putrefacto. Istud vero non fit de putrefacto, quia si esset de sanguine putrefacto, natura humana nimis abhorreret hujusmodi medicinam.

Et scias quod si elementa ipsa secundario distillata fuerint, meliora erunt in effectu;

Et si tertio fuerint distillata, optima fiunt, et per ea homo vivere poterit usque ad periodum ultimum suae vitae, absque infirmitate aliqua, si ipsis utatur omni die vel alter. Et tanta est scientia in his distillationibus ultimis quam admodum est in distillationibus Alkimiae. 1) *Explicit.*

2) Nota de sanguine isto humano quod permisceo ipsum recentem cum optima aqua vitae, et ipsum distillabo, et erit pro primo elemento. Et super feces ponam aliam aquam vitae fortissimam et faciam similiter, et erit pro secundo elemento. Et sic faciam tertio, et erit pro tertio elemento.

Remarks.

The directions given in this letter, are, like those in many Alchemical works intentionally left incomplete. It was taken for granted that they were well known to Arnold's correspondent. Especially was this the case with the extraction of the "four elements" (viz. air, water, fire, and earth) "as you well know in alchemy". I have however found a full account of this process in a work of Marcus Antonius Zimara, which is the more appropriate because it describes the extraction of the four elements from human blood. 3)

M. A. Zimara (Biog. Lexicon der Aerzte, VI, 371) was an Italian, and Professor at Padua, who lived 1460—1532. His writings were not printed till after his death. That here quoted had a later editor who evidently added some things not by Zimara, since Paracelsus is quoted. But the passage here given might well have been written in the fifteenth century. The whole work is an extraordinary farrago of superstition and folly. The description evidently refers to an actual process, but what constituents of blood were really contained in the elixir ultimately produced must be very doubtful. Probably there was ammonia and this may have been the only active ingredient, though there may have been other volatile products.

Marci Antonii Zimaræ, Antrum Magico-Medicum (p. 348).

Modus extrahendi seorsim quatuor elementa a quolibet composito.

Sume e quolibet corpore, prout sanguine humano, partes decem, unamque salis communis preparati, inque vitreo vase Hermetice clauso ad fimum equinum

1) In distillationibus ultimis ut vene nostis. Ed. 1597.

2) This note is perhaps by another author.

3) *Marci Antonii Zimarae*, philosophi, *Antrum*, *Magico-medicum*, in quo Arcanorum magico-physicorum, sigillorum, signaturarum &c. Thesaurus locupletissimus &c. Francofurti 1625. Pars Secunda 1626.

calidissimum adhibe, dum materia putrescat, et (quod triginta ad summum dierum spatio accidet) tota in aqueum humorem convertatur. Distilletur hic balneo maris, donec cesset distillatio; tumque elementum habes aquae, remanentibus in vase tribus reliquis, quae vi balnea haud potuerunt. Accipe aquam illam, et denuo super tria alia elementa, id est faeces quae remanserunt; vase uti superius clauso, immitte, et ad balneum per dies septem appone, ut fiat debita commixio. Quo tempore elapso, distilla materiam per cineres, balneo fortiores; habebisque liquorem aurei coloris; ac dum nil amplius stillabit, ab igne remove; duo compositi jam hujus elementa habens: aquam scilicet et aerem; quae si balneo distilles, elementum aquae limpidissimum in recipiens emanabit, remanente in fundo vasis oleo rubro et limpido; quod aeris elementum est. Jam, ut alia duo, ignem videlicet et terram elicere possis, resume denuo lib. IV extracti secundo liquoris, et eas appone ad libram unam materiae quae in vasis fundo remansit; perque diem et noctem balneo maris digerendas sinito: quo fiat debita commixtio, et incorporate, indeque ad ignem immediate flammae, absque cineribus distilla, ascendetque rubeus primum, deinde subniger liquor, qui ignis elementum est, remanente in fundo vasis (dum nihil amplius distillet) materia nigra, quae verum terrae item elementum; quam seorsim asserva. Aquas vero rubeas, quas proxime asservasti, si balneo iterum distilles, et limpidissimam primam et subflavi coloris alteram, remanente in vase oleo ruberrimo, naturae et essentiae ignea recepturus es. Sicque habitis tribus hisce elementis, puris, et per se, ut terrae postremum habere et possis, appone materiam in vas terreum, forti luto obductum, et undequaque clausum ad ignem reverberii, per dies tres, vel si mavis ad fornacem vitriariorum per diem unum: quo ad albedinem usque calcinari ea possit. Tunc tere, et uno e superioribus elementis, puta aere, vel igne, vel utroque simul imbibe: dum tertia vasis pars saltem impleatur, distillaque modo immediate praecedenti: distillationem antecedentibus multo nobiliorem habiturus. Nam si postremum hoc distillatum, per balneum distilles, quam perfectum, et excellens sit quod in fundo remanebit, norunt qui talia confecere, potissime si ad circulatoriam admoveatur.

It appears from this account that the extraction of the four elements was by no means a simple matter. One would have imagined that the first product of distillation would be the *air*; that with the application of greater heat the *water* would have passed over it been condensed; that destruction distillation, with intense heat would have furnished the *fire*: and that the residue in the retort would be the *earth*. But an excessively complicated process, difficult to follow, seems to have been thought necessary. Also it would have taken a long time, unless the first part was accelerated by artificial heat, instead of the dung-bath or hot-bed. Moreover, what is of some importance, the alchimist must have required a large quantity of blood, since he speaks in one place of using four pounds of a certain extract.

Before further discussing these two documents, I should like to say a few words about the medicinal use of blood in early times.

It is clear that the custom of drinking fresh human blood was known and practised among the ancients, especially as a cure for epilepsy. References to tbis practice are found in the Natural History of Pliny who speaks of epileptics drinking blood fresh from the wounds of gladiators. This is confirmed by Celsus, Caelius Aurelianus, Aretaeus, (who speaks of the practice with horror) and others. Several later writers speak of placing some drops of the patient's *own* blood on his lips during an epileptic fit. (E.g. Gilbertus Anglicus.)

The story of the use of baths of human blood by the Egyptian kings as a cure for leprosy also originates with Pliny; and was apparently the origin of a therapeutical method which may be traced through the middle ages, being referred to in numerous romances, such as the old French story of Amis and Amile, (found in other literatures with other names) the German poem of "Der arme Heinrich" by Hartmann von Aue, the Arthurian legend of the Holy Grail and others.

M. A. Zimara (op. cit. Antrum Magico-Medicum 1625, p. 57) speaks of the use of human blood in Leprosy.

Adeo est salutaris humanus sanguis ut elephantiasi conspurcati solia balneis ex illo temperaverint, et Orpheus atque Archelaus illitu ejus anginam curari tradiderint, pariter in comitiali morbo Plinius etc.... Alii sani hominis prope horam interfecti, ut ex eo affectu convaleant, sanguinem, sed meo judicio nimis horride, hauriunt.

The blood was applied externally to the skin for leprosy and other cutaneous affections.

That the practice of drinking human blood was well known is shown by the fact that it was denounced and subjected to ecclesiastical penalties by the Church. Menstrual blood was also used medicinally. Theodoric, Bishop of Cervia (Chirurgia Lib. III, cap. 44) recommends this to be used as a clyster for renal or vesical calculus; and it is mentioned by numerous other writers.

But all these things have nothing to do with distillation of blood; still less, as was formerly supposed, with transfusion.

The distillation of human blood, and the preparation of an *elixir vitae* belong to a later period.

The earliest allusions seem to be found in Henri de Mondeville, who

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1) Numerous references on these subjects may be found in the exhaustive work of Professor Hermann Strack. „Das Blut im Glauben und Aberglauben der Menschheit", 8th edition 1900.

refers to the use of *aqua sanguinis humani septies distillati*, as recommended by Theodoric, in his "Libellum secretorum". (I have not found any reference to it in the Chirurgia of Theodoric.)

Guy de Chauliac speaks of the same remedy as having been praised by the alchemists and by Henricus (De Mondeville).

The allusions show that some product distilled from human blood was known in the fourteenth century and earlier, but was apparently not much used. I think that the documents I have given above make it probable that this practice of distilling blood originated with Arnold de Villa Nova. But the surgeons who referred to it, evidently did not know the method, since they speak merely of *water of blood* seven times distilled.

A product obtained from blood by distillation is again spoken of by Marsilio Ficino (1433—1491) the Florentine Platonist in his work *De Triplici Vita*, i.e. 1) *de vita sana*, 2) *de vita longa*, 3) *de vita coelitus comparanda*. In the 11th chapter of the second book, headed "De usu lactis sanguinisque humani pro vita senum", he recommends that old men should suck the milk of a young healthy and cheerful woman, while the moon is waxing (crescente luna) and also that they should suck blood from the vein of the left arm of a healthy, cheerful and temperate young man, to the amount of one or two ounces. He says also that careful physicians try to restore badly nourished old men by means of a liquor of human blood distilled with the highest art. (De Triplici vita, Lib. II, Cap. 11.)

This again shows that the distillation of blood was practised in the fifteenth century; but there is no hint of transfusion.

There was however one historical occurrence in the fifteenth century which has been repeatedly quoted by historians as an instance of the transfusion of blood, I mean the circumstances attending the death of Pope Innocent VIII in 1492.

The story is as follows. The Pope, apparently an old man, was very ill and thought to be at the point of death. A Jewish doctor whose name is not given undertook to save the Pope, if he could have fresh blood from some children. He procured for this purpose three boys of ten years old, and let blood from them by phlebotomy; for which they were to receive a ducat a piece. The children however died soon after the operation; the Jewish doctor fled; and the cure of the Pope was not effected.

The version given by the historians Sismondi, Villari in his life of Savonarola, and Gregorovius in his History of the City of Rome, is that the Jew intended to perform transfusion of the children's blood into the dying Pope. Gregorovius (as quoted by Strack op. cit. p. 97) says that the "jüdischer Leibarzt kam auf den Gedanken, dem Sterbenden das

Lebensblut von Knaben einzuflössen". But as was observed long ago by Landois, there is no proof that transfusion was intended. 1) Recent writers have perpetuated the legend of transfusion, so that it seems desirable to examine the original sources of information.

The story is told in the diary of a contemporary, Stephanus Infessura, with date 1492 preserved in the great historical collections of Muratori, as follows:

Tres pueri decem annorum e venis quorum Judaeus quidam medicus, qui Papam sanum reddere promiserat, sanguinem extraxit, incontinenti mortui sunt. Dixerat namque ille Judaeus se velle sanare Pontificem, dummodo habere posset certam quantitatem sanguinis humani, et quidem juvenis, quem propterea extrahi jussit e tribus pueris, quibus post phlebotomiam unum ducatum pro quolibet donavit, et paulo post mortui sunt. Judaeus quidem fugit et Papa sanatus non fuit. (Muratori, Rerum Ital. Script. Tom. III. Part. II, p. 1241.)

Another ecclesiastical historian, Raynaldus gives however, a more correct account. 2)

Judaeus impostor, qui valetudinem pollicebatur, a tribus pueris annorum decem, qui paulo post emortui sunt, sanguinem exhauserit, ut ex eo pharmacum stillatitium chimica arte paratum, propinandum Pontifici conficeret; quod cum Innocentius rescivisset, execratus nefas, Judaeum jussit facessere, qui mox fuga supplicio se subduxit.

In all this there is not a word about transfusion, and we may safely dismiss the supposition that the Jewish Doctor wanted the children's blood for this purpose. Looking at the occurrence in the light of the extracts given above, we see that he intended to distil from the blood the potent *elixir vitae* of Arnold de Villa Nova, which was able to restore the apparently dead to life; and the process for which was doubtless handed down among the alchemists, though kept as a secret of the art.

In the account of the actual process given by Zimara we may also find a probable explanation of the fatal result. It is evident from what has been said above that a large quantity of blood was required, perhaps even some pounds. To obtain the necessary amount, the unfortunate children must have been bled copiously, and in the hurry of the moment recklessly; so that more blood was taken from them than they could bear. The Doctor's mistake seems to have been that he did not provide himself with a sufficient number of blood-givers. Had he employed more children

1) Landois, Beiträge zur Gesch. der Transfusion der Blutes. Leipzig 1878, p. 6.
2) Raynaldus, Annales Ecclesiastici. Tom. XI, p. 197 (anno 1492).

he might have obtained as much blood as he required without bleeding them to death. Whether the Pope would have been saved, or been any better for the elixir, if prepared, is quite another matter.

I cannot discuss the further history of transfusion. Professor Landois, who has done so much to elucidate this question, has quoted in the work above mentioned, passages from Hieronymus Cardanus, towards the end of the sixteenth century, Magnus Pegelius in 1604, Andreas Libavius in 1615, who criticises the last named author with bitter sarcasm, and Johannes Colle of Padua 1628, showing that the possibility of transferring the blood of one person to another was discussed. Cardanus says: "There "are *some who hope to be able* to exchange the blood (of one man) for "that of a healthy young man by a double tube, and some by a single "tube." Pegelius uses mysterious terms which seem to hint at something of the same kind. Libavius describes an imaginary operation by which blood was passed through a tube from the *artery* of a robust man into the *artery* of a weak man: but shows that he did not take the matter seriously when he ends with recommending *hellebore* for the Doctor (to cure his madness). J. Colle suggests that blood might be passed by a tube from the veins of one man into the veins of another, but that the operation would be useless.

With great respect for the eminent physiologist, one must doubt whether these operations were more than talked about. There is no evidence that they were actually performed. For before Harvey's discovery of the circulation, such an operation would have been hardly reasonable. When the veins were thought to conduct blood away from the heart, what would be the use on this theory of introducing fresh blood into a vein, to be transmitted, if at all, only to its peripheral branches? Again to transfer blood by a tube from one artery to another would be going against the stream, and the suggestion made by Libavius seems to have been ironical. The whole thing seems ideal rather than actual; unless indeed some of these physicians had tried such experiments and failed; of which there is no evidence. At all events we must agree with Landois that these numerous allusions to transfusion of blood, which are met with especially in Italy, not based upon a knowledge of the circulation, are from a scientific point of view entirely worthless, as indeed the more sagacious contemporaries probably perceived.

The English investigators, he says, were right in asserting that they had borrowed their invention from no foreign source.

The first actual transference of blood from one animal to another was performed by Richard Lower at Oxford, February 1665—66; and reported by Willis to the Royal Society of London in the following June (1666).

Later, the experiment was also made upon the human subject before the Royal Society as also in Paris and elsewhere.

Further I may observe that the works published shortly after this time professing to give a history of transfusion, such as J. D. Major (1667), J. S. Elsholtz (1667), G. A. Mercklin junr. (1679), Santinelli (Confusio transfusionis 1668) all speak of the operation as something quite new. Elsholtz, on his title page speaks of "*omnibus saeculis inaudita sanguinis transfusio*". One writer, Franc. Folli (1680) only claims that he had made similar experiments shortly before those of Lower. There are other writers whose works I have not seen, but the general evidence is unanimous on this point.

We must conclude then that actual transfusion of blood from one person to another was not actually performed till after the year 1665. That some of the stories supposed to refer to this operation refer actually to the use of human blood in a very different way. That a secret process for professing an elixir from human blood was known to the alchemists for some centuries, and probably originated with Arnold de Villa Nova.

Modern discoveries relating to Organo-Therapy, and the therapeutical effects of blood serum suggest that blood may not be without some medicinal power; but there is not the least probability that human blood will be again brought into use as a remedy. The possibility of extracting substances of therapeutic value from the blood of other animals, need not however be entirely ignored.

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